SUBCHAPTER F : DRINKING WATER STANDARDS GOVERNING DRINKING WATER QUALITY AND REPORTING REQUIREMENTS FOR PUBLIC WATER SUPPLY SYSTEMS §§290.101 - 290.121

§290.101. Purpose.

The purpose of these standards is to assure the safety of public water supplies with respect to microbiological, chemical and radiological quality and to further efficient processing through control tests, laboratory checks, operating records and reports of public water supply systems. These standards are written so as to comply with the requirements of Public Law 93-523, the Federal "Safe Drinking Water Act," and the "Primary Drinking Water Regulations" which have been promulgated by the Environmental Protection Agency, under the authority granted by Public Law 93-523.

§290.102. Definitions.

The following definitions shall apply in the interpretation and enforcement of these standards.

Approved laboratory - A laboratory certified and approved by the Texas Department of Health to analyze water samples to determine their compliance with maximum allowable constituent levels.

Commission - the Texas Natural Resource Conservation Commission.

Community water system - A public water system which has a potential to serve at least 15 service connections on a year-round basis or serves at least 25 individuals on a year-round basis. Service connections shall be counted as one for each single family residential unit or each commercial or industrial establishment to which drinking water is supplied from the system.

Compliance cycle - The nine-year (calendar year) cycle during which public water systems must monitor. Each compliance cycle consists of three three-year compliance periods. The first calendar-year cycle begins January 1, 1993 and ends December 31, 2001; the second begins January 1, 2002 and ends December 31, 2010; the third begins January 1, 2011 and ends December 31, 2019.

Compliance period - A three-year (calendar year) period within a compliance cycle. Each compliance cycle has three three-year compliance periods. Within the first compliance cycle, the first compliance period is called the initial compliance period and runs from January 1, 1993 to December 31, 1995; the second from January 1, 1996 to December 31, 1998; the third from January 1, 1999 to December 31, 2001.

Control tests - Chemical, physical or microbiological tests made by the operator of the water system to control the quality or quantity of water served to the public and recorded regularly in the operating records.

Drinking water - All water distributed by any agency or individual, public or private, for the purpose of human consumption or which may be used in the preparation of foods or beverages or for the cleaning of any utensil or article used in the course of preparation or consumption of food or beverages for human beings. The term "Drinking Water" shall also include all water supplied for human consumption or used by any institution catering to the public.

Entry Point - An entry point to the distribution system is a point which is representative of the water from each well after treatment or for surface water systems or a combination of surface and ground water systems; a point which is representative of each source or treatment point after any application of treatment.

Executive Director - The Executive Director of the Commission.

Human consumption - Uses by humans in which water can be ingested into or absorbed by the human body. Examples of these uses include, but are not limited to drinking, cooking, brushing teeth, bathing, washing hands, washing dishes and preparing foods.

MCL - An acronym for Maximum Contaminant Level.

Monthly Reports of Water Works Operations - The daily record of data relating to the operation of the system facilities compiled in a monthly report.

Non-community water system - Any public water system which is not a community water system.

Non-transient non-community water system or "NTNCWS" - A public water system that is not a community water system and that regularly serves at least 25 of the same persons over six months per year.

Public water system - A system for the provision to the public of piped water for human consumption. Such a system must have a potential to serve at least 15 service connections or 25 individuals at least 60 days out of the year. This term includes any collection, treatment, storage, and distribution facilities under control of the operator of such system and used primarily in connection with such system; and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Two or more water systems with each having a potential to serve less than 15 connections or less than 25 individuals but owned by the same person, firm or corporation and located on adjacent land will be considered a public water system when the total potential service connections in the combined systems are 15 or greater or if the total number of individuals served by the combined systems total 25 or more at least 60 days out of the year. Without excluding other meanings of the terms "individual" or "served," an individual shall be deemed to be served by a water system if he resides in, uses as his place of employment, or works in, a place to which drinking water is supplied from the system. A public water system is either a "community water system" or a "noncommunity water system" as defined in this section.

Repeat Compliance Period - Any subsequent compliance period after the initial compliance period.

Sanitary survey - An onsite review of the water source, facilities, equipment, operation and maintenance of a public water system, for the purpose of evaluating the adequacy for producing and distributing safe drinking water.

§290.103. Standards of Chemical Quality.

All analyses to determine compliance shall be performed by an approved laboratory. Analyses shall be performed on treated water at all entry points to the distribution system except where otherwise stated.

(1) Inorganic Chemicals. The maximum contaminant levels for inorganic contaminants listed below apply to community and non-transient, non-community water systems. The maximum contaminant levels for nitrate, nitrite and total nitrate and nitrite also apply to transient non-community water systems.

Contaminant	MCL (mg/l)
Antimony	0.006
Arsenic	0.05
Asbestos	7 million fibers/liter (longer than 10μm)
Barium	2.0
Beryllium	0.004
Cadmium	0.005
Chromium	0.1
Cyanide	0.2 (as free Cyanide)
Fluoride	4.0
Mercury	0.002
Nickel	0.1
Nitrate	10.0 (as Nitrogen)
Nitrite	1.0 (as Nitrogen)
Nitrate & Nitrite (Total)	10.0 (as Nitrogen)
Selenium	0.05
Thallium	0.002

(2) Fluoride. Maximum contaminant level for fluoride in community water systems is 4.0 mg/l. Also, see §290.113 of this title (relating to Recommended Secondary Constituent Levels Applicable to All Public Water Systems) which establishes a recommended secondary constituent level of 2.0 mg/l.

(3) Maximum Contaminant Levels (MCLs) for Organic Compounds.

(A) Synthetic Organic Chemicals (SOCs). The following maximum contaminant levels for synthetic organic contaminants apply to community and non-transient, non-community water systems.

Contaminant	MCL (mg/l)
Alachlor	0.002
Aldicarb	0.003
Aldicarb Sulfoxide	0.004
Aldicarb Sulfone	0.002
Atrazine	0.003
Benzo[a]pyrene	0.0002
Carbofuran	0.04
Chlordane	0.002
Dalapon	0.2
Dibromochloropropane	0.0002
Di(2-ethylhexyl)adipate	0.4
Di(2-ethylhexyl)phthalate	0.006
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylene dibromide	0.00005
Glyphosate	0.7
Heptachlor	0.0004
Heptachlor epoxide	0.0002
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.04
Oxamyl (Vydate)	0.2
Pentachlorophenol	0.001
Picloram	0.5
Polychlorinated biphenyls (PCB)	0.0005
Simazine	0.004
Toxaphene	0.003
2,3,7,8-TCDD (Dioxin)	3×10^{-8}
2,4,5-TP	0.05
2,4-D	0.07

(B) Volatile Organic Chemicals (VOCs). The following maximum contaminant levels for volatile organic contaminants apply to community and non-transient, non-community water systems.

Contaminant	MCL (mg/l)
1,1-Dichloroethylene	0.007
1,1,1-Trichloroethane	0.2
1,1,2-Trichloroethane	0.005
1,2-Dichloroethane	0.005
1,2-Dichloropropane	0.005
1,2,4-Trichlorobenzene	0.07
Benzene	0.005
Carbon tetrachloride	0.005
cis-1,2-Dichloroethylene	0.07
Dichloromethane	0.005
Ethylbenzene	0.7
Monochlorobenzene	0.1
o-Dichlorobenzene	0.6
para-Dichlorobenzene	0.075
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1.0
trans-1,2-Dichloroethylene	0.1
Trichloroethylene	0.005
Vinyl chloride	0.002
Xylenes (total)	10.0

(4) Variances and exemptions. Variances and exemptions, as defined in subparagraphs (A), (B) and (C) of this paragraph, may be granted at the discretion of the commission.

(A) Variance - An exception to one or more of the maximum allowable levels which is necessary because the condition of the system's raw water is such that the maximum allowable level cannot be met despite the application of the best available treatment techniques (taking costs into consideration) subject to the following conditions:

(i) the public water system requesting the variance was in operation on the date these standards became effective;

(ii) the granting of the variance will not result in an unreasonable risk to public health;

(iii) a schedule, including increments of progress, is established to bring the system into compliance with the standard in question.

(B) Exemption - Exception to a provision of these standards where, because of compelling factors (which may include economic), the system is unable to comply with a specified allowable level. An exemption may be granted only under the following circumstances:

(i) the public water system requesting the exemption was in operation on the date these standards became effective, or for a system that was not in operation by that date, only if no reasonable alternative source of drinking water is available to such new system;

(ii) the granting of the exemption will not result in an unreasonable risk to public health;

(iii) a schedule is established to bring the system into compliance with the standard in question.

(C) Applications for such variances and/or exemptions must be submitted by the water system requesting a variance or exemption and must include the following:

(i) a statement of the standard which is not met;

(ii) an estimate of the risk involved to public health with supporting evidence from physicians or dentists in the area;

(iii) a long range plan for the correction of the problem. This plan or compliance schedule must be submitted within one year following written notification that a variance or exemption has been granted;

(iv) a detailed economic evaluation of the current and future situation.

(D) A variance or exemption covering a group or class of systems with a common standard which is not met may be issued by the commission without individual application. However, individual compliance schedules will be required for each such system within one year following written notification by the commission that such a variance or exemption has been granted. After receiving notification from the commission that a group or class variance or exemption has been issued to their system, each system must submit the above items in accordance with subparagraph (C) (ii)-(iv) of this paragraph.

(E) The commission is required to act upon all requests for variances or exemptions within a reasonable time period, not to exceed 90 days.

(F) Procedures for public comment and public hearings on variances, exemptions, and compliance schedules as a condition of a variance or exemption will be as stated in the EPA National Primary Drinking Water Regulations, of 40 Code of Federal Regulations, §141.4 and §142.20.

(5) Public notification requirements.

(A) Maximum contaminant level (MCL), treatment technique, and variance and exemption schedule violations. The owner or operator of a public water system which fails to comply with an applicable MCL or treatment technique established by this chapter or which fails to comply with the requirements of any schedule prescribed pursuant to a variance or exemption, shall notify persons served by the system as follows:

(i) Except as provided in clause (iii) of this subparagraph, the owner or operator of a public water system must give notice:

(I) By publication in a daily newspaper of general circulation in the area served by the system as soon as possible, but in no case later than 14 days after notification from the commission of the violation or failure. If the area served by a public water system is not served by a daily newspaper of general circulation, notice shall instead be given by publication in a weekly newspaper of general circulation serving the area; and

(II) By mail delivery (by direct mail or with the water bill), or by hand delivery, not later than 45 days after the violation or failure. The commission may waive mail or hand delivery if it determines that the owner or operator of the public water system in violation has corrected the violation or failure within the 45-day period. The commission must make the waiver in writing and within the 45-day period; and

(III) For violations of the MCLs of contaminants that may pose an acute risk to human health, by furnishing a copy of the notice to the radio and television stations serving the area served by the public water system as soon as possible but in no case later than 72 hours after the violation. The following violations are acute violations:

(-a-) Any violations specified by the commission as posing an acute risk to human health.

(-b-) Any violation of the MCL for nitrate or nitrite as defined in paragraph (1) of this section and determined according to §290.108 of this title.

(ii) Except as provided in clause (iii) of this subparagraph, following the initial notice given under clause (i) of this subparagraph, the owner or operator of the public water system must give notice at least once every three months by mail delivery (by direct mail or with the water bill) or by hand delivery, for as long as the violation or failure exists.

(iii) Alternate notification requirements shall be as follows.

(I) In lieu of the requirements of clause (i)(I) of this subparagraph, the owner or operator of a community water system in an area that is not served by a daily or weekly newspaper of general circulation must give notice by hand delivery or by continuous posting in conspicuous places within the area served by the system. Notice by hand delivery or posting must begin as soon as possible, but no later than 72 hours after the violation or failure for acute violations (as defined in clause (i)(III) of this subparagraph), or 14 days after notification from the

commission of the violation or failure (for any other violation). Posting must continue for as long as the violation or failure exists. Notice by hand delivery must be repeated at least every three months for as long as the violation or failure exists.

(II) In lieu of the requirements of clause (i) and (ii) of this subparagraph, the owner or operator of a noncommunity water system may give notice by hand delivery or by continuous posting in conspicuous places within the area served by the system. Notice by hand delivery or posting must begin as soon as possible, but no later than 72 hours after the violation or failure for acute violations (as defined in clause (i)(III) if this subparagraph) or 14 days after notification from the commission of the violation or failure (for any other violation). Posting must continue for as long as the violation or failure exists. Notice by hand delivery must be repeated at least every three months for as long as the violation or failure exists.

(B) Other violations, variances, exemptions. The owner or operator of a public water system which fails to perform monitoring required by these standards, fails to comply with a testing procedure established by this section, is subject to a variance or exemption granted under paragraph (6) of this section shall notify persons served by the system as follows:

(i) Except as provided in clause (iii) of this subparagraph, the owner or operator of a public water system must give notice within three months of the violation or granting of a variance or exemption by publication in a daily newspaper of general circulation in the area served by the system. If the area served by a public water system is not served by a daily newspaper of general circulation, notice shall instead be given by publication in a weekly newspaper of general circulation serving the area.

(ii) Except as provided in clause (iii) of this subparagraph, following the initial notice given under clause (i) of this subparagraph, the owner or operator of the public water system must give notice at least once every three months by mail delivery (by direct mail or with the water bill) or by hand delivery, for as long as the violation exists. Repeat notice of the existence of a variance or exemption must be given every three months for as long as the variance or exemption remains in effect.

(iii) Alternate notification requirements shall be as follows.

(I) In lieu of the requirements of clauses (i) and (ii) of this subparagraph, the owner or operator of a community water system in an area that is not served by a daily or weekly newspaper of general circulation must give notice, within three months of the violation or granting of the variance or exemption, by hand delivery or by continuous posting in conspicuous places with the area served by the system. Posting must continue for as long as the violation exists or a variance or exemption remains in effect. Notice by hand delivery must be repeated at least every three months for as long as the violation exists or a variance or exemption remains in effect.

(II) In lieu of the requirements of clauses (i) and (ii) of this subparagraph, the owner or operator of a noncommunity water system may give notice, within three months of the violation or the granting of the variance or exemption, by hand delivery or by continuous

posting in conspicuous places within the area served by the system. Posting must continue for as long as the violation exists, or a variance or exemption remains in effect. Notice by hand delivery must be repeated at least every three months for as long as the violation exists or a variance or exemption remains in effect.

(C) Notice to new billing units. The owner or operator of a community water system must give a copy of the most recent public notice for any outstanding violation of any maximum contaminant level, or any treatment technique requirement, or any variance or exemption schedule to all new billing units or new hookups prior to or at the time service begins.

(D) General content of public notice. Each notice required by this paragraph must provide a clear and readily understandable explanation of the violation, any potential adverse health effects, the population at risk, the steps that the public water system is taking to correct such violation, the necessity for seeking alternative water supplies, if any, and any preventive measures the consumer should take until the violation is corrected. Each notice shall be conspicuous and shall not contain unduly technical language, unduly small print, or similar items that frustrate the purpose of the notice. Each notice shall include the telephone number of the owner, operator, or designee of the public water system as a source of additional information concerning the notice. Where appropriate, the notice shall be multi-lingual.

(E) Mandatory health effects language. In complying with subparagraph D of this paragraph, the owner or operator of a public water system shall include the language specified for each contaminant in 40 Code of Federal Regulations, §141.32 and available from the commission.

(F) Proof of public notification. Example copies of all notifications required under this paragraph must be submitted to the commission within 10 days of its distribution as proof of public notification.

(6) Best available technology (BAT) for treatment of violations of MCL's set in this section are listed in 40 CFR 141.61 for organic contaminants and 40 Code of Federal Regulations 141.62 for inorganic contaminants.

§290.104. Control Tests.

These tests may be conducted by the operator of the system to judge variations in water quality, to identify objectionable water characteristics, and to detect the presence of foreign substances which may adversely affect the potability of the water. These control tests shall be performed in accordance with procedures approved by the commission. Operators of water treatment plants at all public water systems utilizing coagulation, settling, softening or filtration shall perform daily chemical control tests on the filtered water for turbidity, PH, alkalinity and chlorine residuals; list results on the Monthly Report of Water Works Operation and copy to the commission after each month of operation.

§290.105. Maximum Contaminant Levels (MCLs) for Microbiological Contaminants.

(a) The MCL for microbiological contaminants is based on the presence or absence of total coliform bacteria in a sample.

(1) For a system which collects at least 40 bacteriological samples per month, if no more than 5.0 percent of the samples collected during a month are total coliform-positive, the system is in compliance with the MCL.

(2) For a system which collects fewer than 40 samples/month, if no more than one sample collected during a month is total coliform-positive, the system is in compliance with the MCL for total coliforms.

(b) Any fecal coliform-positive repeat sample or Escherichia coli- positive repeat sample, or any total coliform-positive repeat sample following a fecal coliform-positive or Escherichia coli-positive routine sample, constitutes a violation of the MCL. For purposes of the public notification requirements in §290.103(6) of this title (relating to Standards of Chemical Quality), this is a violation that is an acute risk to health.

(c) Compliance with the MCL for total coliform bacteria in subsections (a) and (b) of this section will be determined for each month in which the system is in operation.

§290.106. Bacteriological Monitoring.

(a) Routine monitoring.

(1) Public water systems must collect routine bacteriological samples at active service connections which are representative of water throughout the distribution system according to a written sample siting plan. Other sampling sites may be used if located adjacent to service connections. These plans are subject to review and revision by the Commission.

(2) The bacteriological monitoring frequency for community and noncommunity water systems is based on the population served by the system, in accordance with the following table:

Population Served	Minimum Number of Samples per Month
1 to 1,000	1
1,001 to 2,500	2
2,501 to 3,300	3
3,301 to 4,100	4
4,101 to 4,900	5
4,901 to 5,800	6
5,801 to 6,700	7
6,701 to 7,600	8
7,601 to 8,500	9
8,501 to 12,900	10
12,901 to 17,200	15
17,201 to 21,500	20
21,501 to 25,000	25
25,001 to 33,000	30
33,001 to 41,000	40
41,001 to 50,000	50
50,001 to 59,000	60
59,001 to 70,000	70
70,001 to 83,000	80
83,001 to 96,000	90
96,001 to 130,000	100
130,001 to 220,000	120
220,001 to 320,000	150
320,001 to 450,000	180
450,001 to 600,000	210
600,001 to 780,000	240
780,001 to 970,000	270
970,001 to 1,230,000	300
1,230,001 to 1,520,000	330
1,520,001 to 1,850,000	360
1,850,001 to 2,270,000	390
2,270,001 to 3,020,000	420
3,020,001 to 3,960,000	450
3,960,001 or more	480

The population for noncommunity systems will be based on the maximum daily population.

(3) The public water system must collect samples at regular time intervals throughout the month, except that a system which uses groundwater (except groundwater under the direct influence

of surface water, as described in §290.42 of this title (relating to Rules and Regulations for Public Water Systems), and serves 4,900 persons or fewer, may collect all required samples on a single day if they are taken from different sites.

(4) Special purpose samples, such as those taken to determine whether disinfection practices are sufficient following pipe placement, replacement, or repair, shall not be used to determine compliance with the MCL for microbiological contaminants.

(b) Repeat monitoring.

(1) If a routine sample is total coliform-positive, the public water system must collect a set of repeat samples within 24 hours of being notified of the positive result, or as soon as possible if the local laboratory is closed.

(A) A system which collects more than one routine sample per month must collect no fewer than three repeat samples for each total coliform-positive sample found.

(B) A system which collects one routine sample per month must collect no fewer than four repeat samples for each total coliform-positive sample found.

(2) The system must collect at least one repeat sample from the sampling tap where the original total coliform-positive sample was taken, and at least one repeat sample at a tap within five service connections upstream and at least one repeat sample at a tap within five service connections downstream of the original sampling site. If a fourth repeat sample is required, it must be collected within five service connections upstream or downstream. If the positive routine sample was collected at the end of the distribution line, one repeat sample must be collected at that point and all other samples must be collected within five connections upstream of that point.

(3) The system must collect all repeat samples on the same day, except that a system with a single service connection may collect daily repeat samples until the required number of repeat samples has been collected.

(4) If one or more repeat samples in the set is total coliform-positive, the public water system must collect an additional set of repeat samples in the manner specified in paragraphs (1)-(3) of this subsection. The additional samples must be collected within 24 hours of being notified of the positive result or as soon as possible if the local laboratory is closed. The system must repeat this process until either total coliforms are not detected in one complete set of repeat samples or the system determines that the MCL for total coliforms has been exceeded.

(5) If a system collecting fewer than five routine samples per month has one or more total coliform-positive samples and the commission does not invalidate the sample(s) in accordance with subsection (c) of this section, it must collect at least five routine samples during the next month the system provides water to the public.

(6) After a system collects a routine sample and before it learns the results of the analysis of that sample, if it collects another routine sample(s) from within five adjacent service connections of the initial sample, and the initial sample, after analysis, is found to contain total coliform bacteria, then the system may count the subsequent sample(s) as a repeat sample instead of as a routine sample.

(7) Results of all routine and repeat samples not invalidated by the commission must be included in determining compliance with the MCL for total coliforms in accordance with §290.105 of this title (relating to Maximum Bacteriological Contaminant Levels (MCLs) for Microbiological Contaminants).

(c) Invalidation of total coliform samples.

(1) A total coliform-positive sample invalidated under this subsection does not count towards meeting the minimum monitoring requirements of this section.

(2) The commission may invalidate a total coliform-positive sample only if one of the following conditions is met:

(A) the laboratory establishes that improper sample analysis caused the total coliform-positive result;

(B) the commission, on the basis of the results of repeat samples collected as required by this section, determines that the total coliform-positive sample resulted from a domestic or other nondistribution system plumbing problem. The commission cannot invalidate a sample on the basis of repeat sample results unless all repeat sample(s) collected at the same tap as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected within five service connections of the original tap are total coliform-negative. Under those circumstances, the system may cease resampling and request that the commission invalidate the sample. The system must provide copies of the routine positive and all repeat samples; or

(C) the commission has substantial grounds to believe that a total coliform-positive result is due to a circumstance or condition which does not reflect water quality in the distribution system. In this case, the system must still collect all repeat samples required by this section, and use them to determine compliance with the MCL for total coliforms in §290.105 of this title (relating to Maximum Contaminant Levels (MCLs) for Microbiological Contaminants). The system must provide written documentation which must state the specific cause of the total coliform-positive sample, and what action the system has taken, or will take, to correct this problem. The commission may not invalidate a total coliform-positive sample solely on the grounds that all repeat samples are total coliform-negative.

(3) If a laboratory invalidates a sample, the system must collect another sample from the same location as the original sample within 24 hours of being notified, or as soon as possible if the laboratory is closed, and have it analyzed for the presence of total coliforms. The system must continue to re-sample within 24 hours and have the samples analyzed until it obtains a valid result.

(d) Fecal coliform bacteria/Escherichia coli (E. coli) testing.

(1) If any routine or repeat sample is total coliform-positive, that total coliform-positive culture medium will be analyzed to determine if fecal coliforms or E. coli bacteria are present. If fecal coliforms or E. coli are present, the system must notify the commission by the end of the day when the system is notified of the test result, unless the system is notified of the result after the commission office is closed, in which case the system must notify the commission before the end of the next business day.

(e) Notification to the Texas Natural Resource Conservation Commission (TNRCC).

(1) A public water system which has exceeded the MCL for total coliforms in §290.105 of this title (relating to Maximum Contaminant Levels for Microbiological Contaminants) must report the violation to the commission no later than the end of the next business day after it learns of the violation, and notify the public in accordance with §290.103(8) of this title (relating to Standards of Chemical Quality).

(2) A public water system which has failed to comply with a coliform monitoring requirement must report the monitoring violation to the commission within ten days after the system discovers the violation, and notify the public in accordance with §290.103(8) of this title (relating to Standards of Chemical Quality).

§290.107. [Reserved for future use.]

§290.108. Inorganic Chemical Monitoring and Analytical Requirements.

Community water systems and non-transient, non-community water systems shall conduct monitoring to determine compliance with the maximum contaminant levels specified in §290.103 of this title (relating to Standards of Chemical Quality). Transient, non-community water systems shall conduct monitoring to determine compliance with the nitrate and nitrite maximum contaminant levels in §290.103 of this title (relating to Standards of Chemical Quality) (as appropriate) in accordance with this section.

(1) Monitoring locations for inorganic constituents other than asbestos shall be determined as follows:

(A) Groundwater systems shall take a minimum of one sample at every entry point to the distribution system (hereafter called a sampling point).

(B) Surface water systems and systems using a combination of ground water and surface water sources shall take a minimum of one sample at every entry point to the distribution system (hereafter called a sampling point).

(C) If a system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water is representative of all sources being used).

(D) Systems shall take subsequent samples at the same sampling points unless conditions make another sampling point more representative of each source or treatment plant.

(E) The commission may reduce the total number of samples which must be analyzed by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed. Compositing of samples must be done in the laboratory or in the field by commission staff.

(i) If the concentration in the composite sample is greater than or equal to the proportional contribution of the MCL of any inorganic chemical, then a follow-up sample must be collected within 14 days from each sampling point included in the composite, (i.e., 20% of MCL when 5 points are composited). These samples must be analyzed for the contaminant(s) which were excessive in the composite sample. Detection limits for each analytical method are as listed in 40 Code Of Federal Regulations 141.23(a)(4)(i).

(ii) Compositing may be permitted only at ground water sampling points within a single system.

(iii) If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these instead of resampling. The duplicates must be analyzed within 14 days of the composite.

(2) The frequency of monitoring to determine compliance with the MCL for asbestos specified in §290.103 of this title (relating to Standards of Chemical Quality) shall be as follows:

(A) Each community and non-transient, non-community water system not receiving a waiver is required to monitor for asbestos during the first three-year compliance period of each nine-year compliance cycle beginning with the initial compliance period.

(B) The commission may grant a waiver based on a consideration of the following factors:

(i) Potential for asbestos contamination of the water source, and

(ii) The use of asbestos-cement pipe for finished water distribution and the corrosive nature of the water.

(C) A waiver remains in effect until the completion of the three-year compliance period.

(D) A system vulnerable to asbestos contamination due solely to corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe, under conditions where asbestos contamination is most likely to occur.

(E) A system vulnerable to asbestos contamination due solely to source water shall monitor in accordance with the provisions of paragraph (1) of this section.

(F) A system vulnerable to asbestos contamination due both to its source water supply and corrosion of asbestos-cement pipe shall take one sample at a tap served by asbestos-cement pipe, under conditions where asbestos contamination is most likely to occur.

(G) A system which exceeds the MCL for asbestos as determined in paragraph (9) of this section shall monitor quarterly beginning in the next quarter after the violation occurs.

(H) The commission may decrease the quarterly monitoring requirement to the frequency specified in paragraph (2)(A) of this section provided the commission has determined that the system is reliably and consistently below the maximum contaminant level. In no case can the commission make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface (or combined surface/ground) water system takes a minimum of four quarterly samples.

(I) If monitoring data collected after January 1, 1990 are generally consistent with the requirements of paragraph (2) of this section (relating to Standards of Chemical Quality), then the commission may allow systems to use that data to satisfy the monitoring requirement for the initial compliance period.

(3) Monitoring conducted to determine compliance with the maximum contaminant levels in §290.103 of this title (relating to Standards of Chemical Quality) for antimony, arsenic, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium, and thallium shall be as follows:

(A) Beginning in the initial compliance period, groundwater systems shall take one sample at each sampling point once every three years. Beginning in the initial compliance period, surface water systems (or combined surface/ground) shall take one sample annually at each sampling point. Each of the sampling frequencies listed in this paragraph constitute one round of sampling for groundwater and surface water systems, respectively.

(B) The commission may grant waivers from the monitoring frequencies specified in subparagraph (3)(A) of this paragraph. The term during which the waiver is effective shall not exceed one compliance cycle (nine years).

(C) A condition of the waiver shall be that a system must take a minimum of one sample while the waiver is effective.

(D) The commission may grant a waiver provided surface water systems have monitored annually for at least three years and groundwater systems have conducted a minimum of three rounds of monitoring. (At least one sample shall have been taken since January 1, 1990.) Both surface and groundwater systems shall demonstrate that all previous analytical results were less than the MCL. Systems that use a new water source are not eligible for a waiver until three rounds of monitoring from the new source have been completed.

(E) In determining the appropriate reduced monitoring frequency, the commission shall consider:

(i) Reported contaminant concentrations from all previous monitoring;

(ii) The degree of variation in reported concentrations; and

(iii) Other factors which may affect contaminant concentrations such as changes in groundwater pumping rates, changes in the system's configuration, changes in the system's operating procedures, or changes in the flow or characteristics of a reservoir or stream used as the water source.

(F) If a decision by the commission is made to grant a waiver it shall be made in writing and shall set forth the basis for the determination. The determination may be initiated by the commission. The commission shall review and, where appropriate, revise the waiver of monitoring frequency when other data relevant to the system become available.

(G) Systems which exceed the IOC MCL's as calculated in paragraph (9) of this section shall monitor quarterly beginning in the next quarter after the violation occurs.

(H) The commission may decrease the quarterly monitoring requirement to the frequencies specified in subparagraphs (A) and (B) of this paragraph provided it has determined that the system is reliably and consistently below the MCL. In no case can the commission make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples.

(4) All public water systems (community; non-transient, non-community; and transient, non-community) shall monitor to determine compliance with the maximum contaminant level for nitrate as follows:

(A) Community and non-transient, non-community water systems served by groundwater shall monitor annually beginning January 1, 1993; systems served by surface water shall monitor quarterly beginning January 1, 1993.

(B) Each transient non-community water system shall monitor annually beginning January 1, 1993.

(C) The repeat monitoring frequency for community and non-transient, non-community groundwater systems shall be quarterly for at least one year following any one sample in which the concentration is ≥ 50 percent of the MCL. The commission may allow a groundwater system to reduce the sampling frequency to annually after four consecutive quarterly samples are reliably and consistently less than the MCL.

(D) The commission may allow community and non-transient, non-community water systems to reduce the sampling frequency to annually if all analytical results from four consecutive quarters are less than 50 percent of the MCL. A surface water system shall return to quarterly monitoring if any one sample is greater than 50 percent of the MCL.

(E) After the initial round of quarterly sampling for surface water systems is completed, any community or non-transient non-community system which is monitoring annually shall take subsequent samples during the quarter which previously resulted in the highest analytical result.

(5) All public water systems (community; non-transient, non-community; and transient, non-community systems) shall monitor to determine compliance with the maximum contaminant level for nitrite as follows:

(A) All public water systems shall take one sample at each sampling point during the initial compliance period.

(B) After the initial sample, systems where the analytical result for nitrite is <50 percent of the MCL shall monitor at the frequency specified by the commission.

(C) The repeat monitoring frequency for nitrite for all public water systems shall be quarterly for at least one year following any one sample in which the concentration is ≥50 percent of the MCL. The commission may allow a system to reduce the sampling frequency to annual after determining the system is reliably and consistently less than the MCL.

(D) Systems which are monitoring annually shall take each subsequent sample during the quarter which previously resulted in the highest analytical result.

(6) Confirmation sampling:

(A) Where the results of sampling for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium or thallium indicate an exceedance of the MCL, one additional sample from the same sampling point shall be collected as soon as possible after the initial sample.

(B) Where nitrate or nitrite sampling results indicate an exceedance of the maximum contaminant level, the system shall take a confirmation sample within 24 hours of the system's receipt of notification of the analytical results of the first sample. Systems unable to comply with the 24-hour sampling requirement must immediately notify the consumers served by the public water system in accordance with §290.103(8)(A)(iii) of this title (relating to Standards of Chemical

Quality). Systems exercising this option must take and analyze a confirmation sample within two weeks of notification of the analytical results of the first sample.

(C) If a commission-required confirmation sample is taken for any contaminant, then the results of the initial and confirmation sample shall be averaged. The resulting average shall be used to determine the system's compliance in accordance with paragraph (9) of this section. The commission has the discretion to delete results of obvious sampling errors.

(7) The commission may require more frequent monitoring than specified in paragraphs (2)-(5) of this section or may require confirmation samples for positive and negative results at its discretion.

(8) Systems may apply to the commission to conduct more frequent monitoring than the minimum monitoring frequencies specified in this section.

(9) Compliance with §290.103 of this title (relating to Standards of Chemical Quality) (as appropriate) shall be determined based on the analytical result(s) obtained at each sampling point.

(A) For systems which are conducting monitoring at a frequency greater than annual, compliance with the MCLs for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium and thallium is determined by a running annual average at each sampling point. If the average at any sampling point is greater than the MCL, then the system is out of compliance. If any one sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any sample below the method detection limit shall be calculated at zero for the purpose of determining the annual average.

(B) For systems which are monitoring annually, or less frequently, the system is out of compliance for antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, cyanide, fluoride, mercury, nickel, selenium and thallium if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the commission, the determination of compliance will be based on the average of the two samples.

(C) Compliance with the MCLs for nitrate and nitrite is based on one sample if the levels of these contaminants are below the MCLs. If the levels of nitrate or nitrite exceed the MCLs in any sample, a confirmation sample is required in accordance with paragraph (6)(B) of this section, and compliance shall be based on the average of the initial and confirmation samples.

(D) If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the commission may allow the system to give public notice to only the area served by that portion of the system which is out of compliance.

(10) Each public water system shall monitor at the time designated by the commission during each compliance period.

§290.109. Organic Chemical (Other Than Trihalomethanes) Monitoring, Analytical Requirements and Treatment Techniques.

(a) Monitoring and analysis of the SOC contaminants listed in §290.103(3)(A) of this title (relating to Standards of Chemical Quality) for the purposes of determining compliance with the maximum contaminant level shall be conducted as follows:

(1) Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). Each subsequent sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(2) Surface water systems shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). Each subsequent sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(3) If the system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used).

(4) Synthetic Organic Chemical (SOC) Monitoring Frequency:

(A) Each community and non-transient non-community water system shall take four consecutive quarterly samples for each contaminant listed in §290.103(3)(A) of this title (relating Standards of Chemical Quality) during each compliance period beginning with the initial compliance period.

(B) Systems serving more than 3,300 persons which do not detect a contaminant in the initial compliance period, may reduce the sampling frequency to a minimum of two consecutive quarterly samples in one year during each repeat compliance period.

(C) Systems serving less than or equal to 3,300 persons which do not detect a contaminant in the initial compliance period may reduce the sampling frequency to a minimum of one sample during each repeat compliance period.

(5) The commission may grant a waiver from the requirement of paragraph (a)(4) of this section. after evaluating the following factors: Knowledge of previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the water source(s). If a determination by the commission reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted. If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted:

(A) previous analytical results;

(B) the proximity of the system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at drinking water sources, manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities. Non-point sources include the use of pesticides to control insects, weeds, or pests on agricultural areas, forest lands, home and garden property, or other land application uses;

(C) the environmental persistence and transport of the pesticide herbicide or contaminant.

(D) how well the water source is protected against contamination due to such factors as depth of the well, type of soil and the integrity of well construction. Surface water systems must consider watershed vulnerability and protection;

(E) elevated nitrate levels at the water supply source; and

(F) use of PCBs in equipment used in the production, storage, or distribution of water (i.e., PCBs used in pumps, transformers, etc.).

(6) The commission will consider the waiver for each compliance period.

(7) If an organic SOC contaminant listed in §290.103 (3) (A) of this title (relating to Standards of Chemical Quality) is detected, as defined in 40 CFR 141.24 (h) (18), in any sample, then:

(A) The system must monitor quarterly at each sampling point at which a detection occurs.

(B) The commission may decrease the quarterly monitoring requirement specified in subparagraph (A) of this paragraph provided it has determined that the system is reliably and consistently below the MCL. In no case shall the commission make this determination unless a groundwater system takes a minimum of two consecutive quarterly samples and a surface water system takes a minimum of four consecutive quarterly samples.

(C) After the commission determines that a system is reliably and consistently below the MCL, it may allow the system to monitor annually. Systems which monitor annually must monitor during the quarter that previously yielded the highest analytical result.

(D) Systems which have three consecutive annual samples with no detection of a contaminant be granted a waiver as specified in paragraph (6) of this subsection.

(E) If monitoring results in detection of one or more of certain related contaminants (aldicarb, aldicarb sulfone, aldicarb sulfoxide and heptachlor, heptachlor epoxide), then subsequent monitoring shall analyze for all related contaminants.

(8) Systems which violate the MCL's of §290.103(3)(A) of this title (relating to Standards of Chemical Quality) as determined by paragraph (a)(11) of this section must monitor quarterly. After a minimum of four quarterly samples show the system is in compliance and the commission determines the system is reliably and consistently below the MCL, as specified in paragraph (a)(11) of this section, the system shall monitor at the frequency specified in paragraph (a)(7)(C) of this section.

(9) The commission may require a confirmation sample for positive or negative results. If a confirmation sample is required by the commission, the result must be averaged with the first sampling result and the average used for the compliance determination as specified by paragraph (15) of this subsection. The commission has discretion to delete results of obvious sampling errors from this calculation.

(10) The commission may reduce the total number of samples required from a system for analysis by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.

(A) If, in the composite sample, a detection of one or more SOC contaminants listed in §290.103(3)(A) of this title (relating to Standards of Chemical Quality) occurs, then a follow-up sample must be taken from each sampling point included in the composite and analyzed within 14 days of collection.

(B) If duplicates of the original sample taken from each sampling point used in the composite are available, the commission may use these duplicates instead of resampling. The duplicate must be analyzed within 14 days of collection and the results reported to the commission.

(C) Compositing may only be permitted at sampling points within a single system.

(11) Compliance with the MCL's of §290.103(3)(A) of this title (relating to Standards of Chemical Quality) shall be determined based on the analytical results obtained at each sampling point.

(A) For systems which are conducting monitoring at a frequency greater than annual, compliance is determined by a running annual average of all samples taken at each sampling point. If the annual average of any sampling point is greater than the MCL, then the system is out of compliance. If the initial sample or a subsequent sample would cause the annual average to be exceeded, then the system is out of compliance immediately. Any samples below the detection limit shall be calculated as zero for purposes of determining the annual average.

(B) If monitoring is conducted annually, or less frequently, the system is out of compliance if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the commission, the determination of compliance will be based on the average of the two samples.

(C) If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the commission may allow the system to give public notice to only that portion of the system which is out of compliance.

(12) If monitoring data collected after January 1, 1990, are generally consistent with the requirements of subsection (a) of this section, then the commission may allow systems to use that data to satisfy the monitoring requirement for the initial compliance period.

(13) The commission may increase the required monitoring frequency, where necessary, to detect variations within the system (e.g., fluctuations in concentration due to seasonal use, changes in water source, etc.).

(14) The commission has the authority to determine compliance or initiate enforcement action based upon analytical results and other information compiled by their sanctioned representatives and agencies.

(15) Each public water system shall monitor at the time designated by the commission within each compliance period.

(b) Beginning with the initial compliance period: sampling and analysis of the VOC contaminants listed in §290.103 (3)(B) of this title (relating to Standards of Chemical Quality), for the purpose of determining compliance with the MCLs shall be conducted as follows:

(1) Groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment (hereafter called a sampling point). Each subsequent sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(2) Surface water systems (and combined surface/ground water systems) shall take a minimum of one sample at points in the distribution system that are representative of each source or at each entry point to the distribution system after treatment (hereafter called a sampling point). Each subsequent sample must be taken at the same sampling point unless conditions make another sampling point more representative of each source or treatment plant.

(3) If the system draws water from more than one source and the sources are combined before distribution, the system must sample at an entry point to the distribution system during periods of normal operating conditions (i.e., when water representative of all sources is being used).

(4) Each community and non-transient non-community water system shall take four consecutive quarterly samples for each contaminant listed in §290.103 (3)(B) of this title (relating to Standards of Chemical Quality) during each compliance period, beginning with the initial compliance period.

(5) If the initial monitoring for VOC contaminants listed in §290.103 (3)(B) of this title (relating to Standards of Chemical Quality) as allowed in paragraph (b)(16) has been completed by

December 31, 1992, and the system did not detect any contaminant listed in §290.103 (3)(B) of this title (relating to Standards of Chemical Quality) then each ground and surface water system shall take one sample annually beginning with the initial compliance period.

(6) After a minimum of three years of annual sampling, the commission may allow groundwater systems with no previous detection of any contaminant listed for VOCs in §290.103 (3)(B) of this title (relating to Standards of Chemical Quality) to take one sample during each compliance period.

(7) Each community and non-transient groundwater system which does not detect a contaminant listed in §290.103(3)(B) of this title (relating to Standards of Chemical Quality) may be granted a waiver from the requirements of paragraphs (5) and (6) of this subsection after completing the initial monitoring. (For the purposes of this section, detection is defined as $\geq$0.0005 mg/l.) A waiver shall be effective for no more than six years (two compliance periods).

(8) The commission may grant a waiver after evaluating the following factor(s): the knowledge of previous use (including transport, storage, or disposal) of the contaminant within the watershed or zone of influence of the water sources. If a determination by the commission reveals no previous use of the contaminant within the watershed or zone of influence, a waiver may be granted. If previous use of the contaminant is unknown or it has been used previously, then the following factors shall be used to determine whether a waiver is granted:

(A) previous analytical results;

(B) the proximity of the system to a potential point or non-point source of contamination. Point sources include spills and leaks of chemicals at or near a water treatment facility or at drinking water sources manufacturing, distribution, or storage facilities, or from hazardous and municipal waste landfills and other waste handling or treatment facilities;

(C) the environmental persistence and transport of the contaminants;

(D) the number of persons served by the public water system and the proximity of a smaller system to a larger system;

(E) how well the water source is protected against contamination (i.e., is it a surface or groundwater system). Groundwater systems must consider factors such as depth of the well, the type of soil, and well construction. Surface water systems must consider watershed protection.

(9) As a condition of the waiver a groundwater system must take one sample at each sampling point during the time the waiver is effective (i.e., one sample during two compliance periods or six years) and update its vulnerability assessment considering the factors listed in paragraph (8) of this section. Based on this updated vulnerability assessment the commission must reconfirm that the system is not vulnerable. If the commission does not make this reconfirmation within three years of the initial determination, then the waiver is invalid and the system is required to sample annually as specified in paragraph (5) of this section.

(10) Each community and non-transient surface water system which does not detect a contaminant listed for VOCs in §290.103(3)(B) of this title (relating to Standards of Chemical Quality) may be considered by the commission for a waiver from the requirements of paragraph (5) of this subsection after completing the initial monitoring. Systems meeting this criteria must be determined by the commission to be non-vulnerable based on a vulnerability assessment during each compliance period. Each system receiving a waiver shall sample at the frequency specified by the commission (if any).

(11) If a VOC contaminant listed in §290.103(3)(B) of this title (relating to Standards of Chemical Quality) is detected at a level exceeding 0.0005 mg/l in any sample, then:

(A) the system must monitor quarterly at each sampling point which resulted in a detection;

(B) the commission may decrease the quarterly monitoring requirement specified in subparagraph (A) of this paragraph provided it has determined that the system is reliably and consistently below the maximum contaminant level. In no case shall the commission make this determination unless a groundwater system takes a minimum of two quarterly samples and a surface water system takes a minimum of four quarterly samples;

(C) if the commission determines that the system is reliably and consistently below the MCL, the commission may allow the system to monitor annually. Systems which monitor annually must monitor during the quarter which previously yielded the highest analytical result;

(D) Systems which have three consecutive annual samples with no detection of a contaminant may be granted a waiver as specified in paragraph (7) of this subsection.

(E) groundwater systems which have detected one or more of the following two-carbon organic compounds: trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene shall monitor quarterly for vinyl chloride. A vinyl chloride sample shall be taken at each sampling point at which one or more of the two-carbon organic compounds was detected. If the result of the first analysis does not detect vinyl chloride, the commission may reduce the quarterly monitoring frequency for vinyl chloride to one sample during each compliance period. Surface water systems are required to monitor for vinyl chloride as specified by the commission.

(12) Systems which violate the VOC MCL's of §290.103(3)(B) of this title (relating to Standards of Chemical Quality), as determined by paragraph (15) of this subsection, must monitor quarterly. After a minimum of four consecutive quarterly samples which show the system is in compliance as specified in paragraph (15) of this section and the commission determines that the system is reliably and consistently below the maximum contaminant level, the system may monitor at the frequency and time specified in paragraph (11)(C) of this section.

(13) The commission may require a confirmation sample for positive or negative results. If a confirmation sample is required by the commission, the result must be averaged with the

first sampling result and the average is used for the compliance determination as specified by paragraph (15) of this section. The commission has discretion to delete results of obvious sampling errors from this calculation.

(14) The commission may reduce the total number of samples a system must analyze by allowing the use of compositing. Composite samples from a maximum of five sampling points are allowed. Compositing of samples must be done in the laboratory and analyzed within 14 days of sample collection.

(A) If the VOC concentration in the composite sample is $\geq$0.0005 mg/l for any contaminant listed in §290.103(3)(B) of this title (relating to Standards of Chemical Quality), then a follow-up sample must be taken and analyzed within 14 days from each sampling point included in the composite.

(B) If duplicates of the original sample taken from each sampling point used in the composite are available, the system may use these instead of resampling. The duplicate must be analyzed and the results reported to the commission within 14 days of collection.

(C) Compositing may only be permitted by the commission at sampling points within a single system.

(D) Procedures for compositing VOC samples are as stated in 40 Code of Federal Regulations §141.24 (f)(14)(iv).

(15) Compliance with §290.103 (3)(B) of this title (relating to Standards of Chemical Quality) shall be determined based on the analytical results obtained at each sampling point.

(A) For systems which are conducting monitoring at a frequency greater than annual, compliance is determined by a running annual average of all samples taken at each sampling point. If the annual average of any sampling point is greater than the MCL, then the system is out of compliance. If the initial sample or a subsequent sample would cause the annual average to be exceeded, then the system is out of compliance immediately.

(B) If monitoring is conducted annually, or less frequently, the system is out of compliance if the level of a contaminant at any sampling point is greater than the MCL. If a confirmation sample is required by the commission, the determination of compliance will be based on the average of the two samples.

(C) If a public water system has a distribution system separable from other parts of the distribution system with no interconnections, the commission may allow the system to give public notice to only that area served by that portion of the system which is out of compliance.

(16) The commission may allow the use of monitoring data collected after January 1, 1988 for purposes of initial monitoring compliance. If the data are generally consistent with the other requirements in this section, the commission may use these data (i.e., a single sample rather than four

quarterly samples) to satisfy the initial monitoring requirement of paragraph (4) of this subsection. Systems which use these samples and do not detect any contaminant listed in §290.103 (3)(B) of this title (relating to Standards of Chemical Quality) shall begin monitoring annually in accordance with paragraph (5) of this subsection beginning January 1, 1993.

(17) The commission may increase required monitoring where necessary to detect variations within the system.

(18) Each public water system shall monitor at the time designated by the commission within each compliance period.

(19) Analysis of unregulated contaminants shall be as specified in 40 Code of Federal Regulations (CFR) §141.40. The commission adopts by reference Federal Regulations referred to in this subsection. Copies are available for review in the Water Utilities Division, Texas Natural Resource Conservation Commission, P. O. Box 13087 Austin, Texas 78711-3087.

(c) Acrylamide and Epichlorohydrin Treatment Techniques. Each public water system must certify annually to the commission (using third party or manufacturer's certification) that when acrylamide or epichlorohydrin are used in drinking water systems, the combination (or product) of dose and monomer level does not exceed 0.05% dosed at 1 ppm (or equivalent) for acrylamide and 0.01% dosed at 20 ppm (or equivalent) for epichlorohydrin.

§290.110. Radiological Sampling and Analytical Requirements.

(a) Maximum contaminant levels for radium-226, radium-228 and gross alpha particle radioactivity for community systems:

(1) Combined radium-226 and radium-228 - 5 pCi/l

(2) Gross alpha particle activity (including radium-226 but excluding radon and uranium) - 15 pCi/l.

(b) Maximum contaminant levels for beta particle and photon radioactivity from man-made radionuclides in drinking water in community water systems.

(1) The average annual concentration of beta particle and photon radioactivity from man-made radionuclides in drinking water shall not produce an annual dose equivalent to the total body or any internal organ greater than 4 millirem (mrem)/year.

(2) Except for the radionuclides listed in Table A, the concentration of man-made radionuclides causing 4 mrem total body or organ dose equivalents shall be calculated on the basis of a 2-liter-per-day drinking water intake using the 168 hour data listed in "Maximum Permissible Body Burdens and Maximum Permissible Concentration of Radionuclides in Air or Water for Occupational Exposure," NBS Handbook 69 as amended August, 1963, U.S. Department of Commerce. If two or more radionuclides are present, the sum of their annual dose equivalent to the total body or to any organ

shall not exceed 4 mrem/year. Table A - Average annual concentrations assumed to produce a total body or organ dose of 4 mrem/year.

Radionuclide	Critical Organ	pCi Per Liter
Tritium	Total Body	20,000
Strontium-90	Bone Marrow	8

(c) Monitoring frequency for radioactivity in community water systems.

(1) Monitoring requirements for gross alpha particle activity, radium-226 and radium-228.

(A) Compliance with subsection (a) of this section shall be based on the analysis or analyses of four quarterly samples.

(i) A gross alpha particle activity measurement may be substituted for the required radium-226 and radium-228 analysis provided that the measured gross alpha particle activity does not exceed 5 pCi/lat a confidence level of 95 percent (1.65 o where o is the standard deviation of the net counting rate of the sample.)

(ii) When the gross alpha particle activity exceeds 5 pCi/l, the same or an equivalent sample shall be analyzed for radium-226. If the concentration of radium-226 exceeds 3 pCi/l the same or an equivalent sample shall be analyzed for radium- 228.

(B) Suppliers of water shall monitor at least once every four years following the procedure required by subparagraph (A) of this paragraph. At the discretion of the commission, when an annual record taken in conformance with subparagraph (A) of this paragraph has established that the average annual concentration is less than one-half the maximum contaminant levels established by subsection (a) of this section, analysis of a single sample may be substituted for the quarterly sampling procedure required by subparagraph (A) of this paragraph.

(i) More frequent monitoring shall be conducted when required by the commission in the vicinity of mining or other operations which may contribute alpha particle radioactivity to either surface or groundwater sources of drinking water, or when changes in the distribution system or treatment processing occur which may increase the concentration of radioactivity in the finished water.

(ii) A supplier of water shall monitor in conformance with subparagraph (A) of this paragraph within one year of the introduction of new water source for a community water system.

(iii) A community water system using two or more sources having different concentrations of radioactivity shall monitor the source of water, in addition to water from a free-flowing tap, when required by the commission.

(iv) Monitoring for compliance with subsection (a) of this section after the initial period need not include radium-228 provided that the average concentration of radium-228 has been assayed at least once using the quarterly sampling procedure required by subparagraph (A) of this paragraph.

(v) Suppliers of water shall conduct annual monitoring of any community water system in which the radium 226 concentration exceeds 3 pCi/l when required by the commission.

(C) If the average annual maximum contaminant level for gross alpha particle activity or total radium as set forth in subsection (a) of this section is exceeded, the supplier of a community water system shall give notice to the commission and notify the public as required by §290.103(8) of this title (relating to Standards of Chemical Quality). Monitoring at quarterly intervals shall be continued until the annual average concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

(2) Monitoring requirements for man-made radioactivity in community water systems.

(A) Systems using surface water sources and serving more than 100,000 persons and such other community water systems as are designated by the commission shall be monitored for compliance with subsection (b) of this section by analysis of four quarterly samples. Compliance with subsection (b) of this section may be assumed without further analysis if the average annual concentration of gross beta particle activity is less than 50 pCi/l and if the average annual concentrations of tritium and strontium-90 are less than those listed in Table A of subsection (b)(2) of this section, provided that if both radionuclides are present, the sum of their annual dose equivalents to bone marrow shall not exceed 4 millirem/year.

(i) If the gross beta particle activity exceeds 50 pCi/l, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with subsection (b) of this section.

(ii) Suppliers of water shall conduct additional monitoring, as required by the commission to determine the concentration of man-made radioactivity in principal watersheds designated by the commission.

(iii) At the discretion of the commission, suppliers of water utilizing only groundwaters may be required to monitor for man-made radioactivity.

(B) After the initial analysis required by subparagraph (A) of this paragraph, suppliers of water shall monitor at least every four years following the procedure given in subparagraph (A) of this paragraph.

(C) The supplier of any community water system designated by the commission as utilizing waters contaminated by effluents from nuclear facilities shall initiate quarterly monitoring for gross beta particle and iodine-131 radioactivity and annual monitoring for strontium-90and tritium.

(i) Quarterly monitoring for gross beta particle activity shall be based on the analysis of monthly samples. If the gross beta particle activity in a sample exceeds 15 pCi/l, the same or an equivalent sample shall be analyzed for strontium-89 and cesium-134. If the gross beta particle activity exceeds 50 pCi/l, an analysis of the sample must be performed to identify the major radioactive constituents present and the appropriate organ and total body doses shall be calculated to determine compliance with subsection (b) of this section.

(ii) For iodine-131, a composite of five consecutive daily samples shall be analyzed once each quarter. When iodine-131 is identified in the finished water more frequent monitoring shall be conducted as required by the commission.

(iii) Annual monitoring for strontium-90 and tritium shall be conducted by the analysis of four quarterly samples.

(iv) The commission may allow the substitution of environmental surveillance data taken in conjunction with a nuclear facility for direct monitoring of man-made radioactivity by the supplier of water where the commission determines such data is applicable to a particular community water system.

(D) If the average annual maximum contaminant level for man-made radioactivity set forth in subsection (b) of this section is exceeded, the operator of a community water system shall give notice to the commission and to the public as required by §290.103(6) of this title (relating to Standards of Chemical Quality). Monitoring at monthly intervals shall be continued until the concentration no longer exceeds the maximum contaminant level or until a monitoring schedule as a condition to a variance, exemption or enforcement action shall become effective.

§290.111. Construction and Siting Requirements.

Construction features and siting of all facilities for new water systems, and for major improvements to existing water systems, must be in conformity with applicable rules and regulations, as promulgated by the Commission.

§290.112. Recordkeeping and Reporting Required of Water Systems.

Any owner or operator of a public water system subject to the provisions of this chapter shall retain on the water system premises or at a convenient location near the premises the following records:

(1) Records of bacteriological analyses must be retained for no less than five years, and records of chemical analyses must be retained for no less than ten years.

(2) Records of action taken by the system to correct violations of primary drinking water regulations must be retained for at least three years after the last action taken with respect to the particular violation involved.

(3) Copies of written reports, summaries or communications relating to sanitary surveys of the system conducted by the system itself, by a private consultant, or by the commission shall be kept for a period not less than ten years after completion of the survey involved.

(4) Records concerning a variance or exemption granted to the system shall be kept for a period ending not less than five years following the expiration of such variance or exemption.

(5) Any owner or operator of a public water system subject to the provisions of this chapter is required to report to the State the results of any test, measurement or analysis required to be made by these standards within ten days following such test, measurement or analysis.

§290.113. Secondary Constituent Levels.

(a) The following secondary constituent levels are limits, applicable to all public water systems. No drinking water supply which does not meet the Secondary Constituent Levels may be used without written approval from the commission.

CONTAMINANT		LEVEL (mg/l except where otherwise stated)
Aluminum		0.05 to 0.2
Chloride		300
Color		15 color units
Copper	1.0	
Corrosivity		Non-corrosive
Fluoride		2.0
Foaming agents		0.5
Hydrogen sulfide		0.05
Iron		0.3
Manganese		0.05
Odor		3 Threshold Odor Number
pH		>7.0
Silver		0.1
Sulfate		300
Total Dissolved Solids		1,000
Zinc		5.0

(b) For all instances in which drinking water does not meet the recommended limits and is accepted for use by the commission, such acceptance is valid only until such time as water of acceptable chemical quality can be made available at reasonable cost to the area(s) in question.

(c) Community water systems that exceed the secondary maximum constituent level for fluoride but are below the level listed in §290.103 of this title (relating to Standards of Chemical Quality) must notify the public. The notice must be made annually by including it with the water bill or by separate mailing to all customers. The form and content of the notice shall be as prescribed by the commission.

§290.114. Modified Monitoring.

When a public water system supplies water to one or more other public water systems, the commission may modify the monitoring requirements imposed by this part to the extent that the interconnection of the systems justifies treating them as a single system for monitoring purposes. Any modified monitoring shall be conducted pursuant to a schedule specified by the commission in concurrence with the Administrator of the U.S. Environmental Protection Agency.

§290.115. Exceptions to these Standards.

These standards shall apply to each public water system, unless the public water system meets all of the following conditions:

(1) consists only of distribution and storage facilities (and does not have any production and treatment facilities);

(2) obtains all of its water from, but is not owned or operated by, a public water system to which such standards apply;

(3) does not sell water to any person;

(4) is not a carrier which conveys passengers in interstate commerce; and

(5) is subject to plumbing restrictions and inspections by the public water system which provides the water.

§290.116. Control of Trihalomethanes in Drinking Water.

(a) For the purpose of this section the following definitions will apply:

(1) "Halogen" means one of the chemical elements chlorine, bromine, or iodine.

(2) "Trihalomethane" (THM) means one of the family of organic compounds named as derivatives of methane, wherein three of the four hydrogen atoms in methane are each substituted by a halogen atom in the molecular structure.

(3) "Total Trihalomethanes" (TTHM) means the sum of the concentration in milligrams per liter of the trihalomethane compounds (trichloromethane, i.e., chloroform;

dibromochloromethane; bromodichloromethane; tribromomethane, i.e., bromoform) rounded to two significant figures.

(4) "Maximum Total Trihalomethane Potential" (MTP) means the maximum concentration of total trihalomethanes produced in a given water containing a disinfectant residual after seven days at a temperature of 25° C or above.

(5) "Disinfectant" means any oxidant added to water in any part of the treatment or distribution process, that is intended to kill or inactivate pathogenic microorganisms.

(b) The maximum contaminant level (MCL) for total trihalomethanes shall be 0.10 milligrams/liter. The MCL shall apply only to those systems which serve a population of 10,000 or more individuals.

(c) Sampling and analytical requirements for total trihalomethanes:

(1) For the purpose of this section, the minimum number of samples required to be taken shall be based on the number of treatment plants used by the system, except that multiple wells drawing raw water from a single aquifer shall be considered as one treatment plant for determining the minimum number of samples. All samples taken within one sampling period shall be collected within a 24-hour period.

(2) For all community water systems utilizing surface water sources in whole or in part, and for all water systems utilizing only groundwater sources that have not been determined to qualify for the reduced monitoring requirements of paragraph (4) of this subsection, analyses for total trihalomethanes shall be performed on at least four samples of water per quarter from each treatment plant used by the system. At least 25 percent of the samples shall be taken at locations within the distribution system reflecting the maximum residence time of the water in the system. The remaining 75 percent shall be taken at representative locations in the distribution system, taking into account number of persons served, different sources of water, and different treatment methods employed. The results of all analyses per quarter shall be arithmetically averaged and reported to the commission within 30 days of the system's receipt of such results. All samples collected shall be used in computing the average, unless the analytical results are invalidated for technical reasons.

(3) Upon the written request of a community water system, the monitoring frequency required by paragraph (2) of this subsection may be reduced by the commission to a minimum of one sample analyzed for TTHM's per quarter taken at a point in the distribution system reflecting the maximum residence time of the water in the system, upon a written determination by the commission that the data from at least one year of monitoring in accordance with paragraph (2) of this subsection and local conditions demonstrate that total trihalomethane concentrations will be consistently below the maximum contaminant level.

(A) If at any time during which the reduced monitoring frequency prescribed under this subsection applies, the results from any analysis exceed 0.10 milligrams/liter of TTHM's and such results are confirmed by at least one check sample taken promptly after such results are obtained,

or if the system makes any significant change to its source of water or treatment program, the system shall immediately begin monitoring in accordance with the requirements of paragraph (2) of this subsection.

(B) If a system is required to begin monitoring in accordance with paragraph (2) of this subsection, such monitoring shall continue for at least one year before a reduction in monitoring frequency may be considered.

(4) Upon the written request to the commission, a community water system utilizing only groundwater sources may seek to have the monitoring frequency reduced to a minimum of one sample for maximum TTHM potential per year taken at a point in the distribution system reflecting maximum residence time of the water in the system. The system shall submit to the Commission the results of at least one sample analyzed for maximum TTHM potential taken at a point in the distribution system reflecting the maximum residence time of the water in the system. The system's monitoring frequency may only be reduced upon a written determination by the commission that, based upon the data submitted by the system, the system has a maximum TTHM potential of less than 0.10 milligrams/liter and that, based upon an assessment of the local conditions of the system, the system is not likely to approach or exceed the maximum contaminant level for TTHM's. The results of all analyses shall be reported to the commission within 30 days of the system's receipt of such results. All samples collected shall be used for determining whether the system must comply with the monitoring requirements of paragraph (2) of this subsection, unless the analytical results are invalidated for technical reasons.

(A) If at any time during which the reduced monitoring frequency prescribed under this subsection is in effect, the result from any analysis taken by the system for the maximum TTHM potential is equal to or greater than 0.10 milligrams/liter, and such results are confirmed by at least one check sample taken promptly after such results are received, the system shall begin immediately to monitor in accordance with the requirements of paragraph (2) of this subsection.

(B) If it becomes necessary to begin monitoring in accordance with paragraph (2) of this subsection, such monitoring shall continue for at least one year before the monitoring frequency may be reduced.

(C) In the event of any significant change to the system's raw water or treatment program, the system shall immediately analyze an additional sample for maximum TTHM potential taken at a point in the distribution system reflecting the maximum residence time of the water in the system for the purpose of determining whether the system must comply with the monitoring requirement of paragraph (2) of this subsection.

(5) Compliance with the MCL of 0.10 milligrams/liter for total trihalomethanes shall be determined based on a running annual average of quarterly samples collected by the system as prescribed in paragraph (2) of this subsection. If the average of samples covering any 12-month period exceeds the maximum contaminant level, the supplier of water shall report to the commission within 30 days and notify the public as required under §290.103(8) of this title (relating to Standards of Chemical Quality). Monitoring after public notification shall be at a frequency designated by the commission

and shall continue until a monitoring schedule as a condition of a variance, exemption, or enforcement action shall become effective.

(6) Before a community water system makes any significant modification to its existing treatment process for the purpose of achieving compliance with this subsection, the system must submit and obtain commission approval of a detailed plan setting forth its proposed modifications and those safeguards that it will implement to ensure that the bacteriological quality of the drinking water served by such system will not be adversely affected by such modifications.

(7) All analyses for determining compliance with the provisions of this subsection shall be conducted in accordance with the procedures required by the U.S. Environmental Protection Agency.

§290.117. Disinfection.

(a) A system that uses a surface water source must provide the disinfection treatment specified in subsection (b) of this section beginning July 1, 1993. A system that uses a groundwater source under the influence of surface water and provides filtration treatment must provide disinfection treatment as specified in subsection (b) of this section by July 1, 1993, or beginning when filtration is installed, whichever is later. Failure to meet any requirement of this section after the applicable date specified in this subsection is a treatment technique violation. Violation of any treatment technique of this section must be reported to the commission by the end of the next business day after the measurement was taken.

(b) Each public water system that utilizes surface water or groundwater under the influence of surface water must provide disinfection treatment as follows.

(1) The disinfection treatment must be sufficient to ensure that the total treatment processes of that system achieve at least 99.9 percent (3-log) inactivation and/or removal of Giardia lamblia cysts and at least 99.99 percent (4-log) inactivation and/or removal of viruses, as determined by the commission.

(A) The disinfectant concentrations(s) within the treatment process shall not be allowed to fall below acceptable levels for more than four hours.

(B) Disinfection contact time will be based on tracer study data submitted by the system and approved by the commission. Acceptable tracer study data must be submitted to the commission no later than January 1, 1993.

(2) The residual disinfectant concentration in the water entering the distribution system measured as specified in §290.119 of this title (relating to Turbidity and Disinfection) shall not be less than 0.2 mg/l free chlorine or 0.5 mg/l chloramine for more than four hours.

(3) The residual disinfectant concentration in the distribution system, as specified in §290.119 of this title (relating to Monitoring Requirements for Systems Using Surface Water

Treatment) shall not be less than 0.2 mg/l free chlorine or less than 0.5 mg/l chloramine in more than five (5.0) percent of the samples each month, for any two consecutive months that the system serves water to the public.

Where: the value "V" in the following formula shall not exceed five (5.0) percent per month for any two consecutive months --

$$V = \frac{b}{a} \times 100$$

Where: a = number of instances where the residual disinfectant concentration is measured;

b = number of instances where the residual disinfectant concentration is measured but is detected at less than 0.2 mg/l free chlorine or less than 0.5 mg/l chloramine.

§290.118. Filtration.

A public water system that uses a surface water source must provide filtration treatment which complies with this section by July 1, 1993. A public water system that uses groundwater under the direct influence of surface water must provide filtration by a date specified by the commission. Such date will not exceed 18 months from the date of notification. Failure to meet any requirement of this section after the applicable date specified in this section is a treatment technique violation. Violation of any treatment technique requirement of this section must be reported to the commission by the end of the next business day after the measurement was taken.

(1) For systems using conventional filtration or groundwater systems under the influence of surface water using direct filtration, the turbidity level of representative samples of a system's filtered water must be less than or equal to 0.5 Nephelometric Turbidity Unit (NTU) in at least 95 percent of the measurements taken each month, measured as specified in §290.119 of this title (relating to Monitoring Requirements for Systems Using Surface Water Treatment); except that if the commission determines that the system is capable of achieving at least 99.9 percent removal and/or inactivation of Giardia lamblia cysts at some turbidity level higher than 0.5 NTU in at least 95 percent of the measurements taken each month, the commission may substitute this higher turbidity limit for that system. However, in no case may the commission approve a turbidity limit that allows more than one (1.0) NTU in more than five (5.0) percent of the samples taken each month.

(2) The turbidity level of representative samples of a system's filtered water must at no time exceed five (5.0) NTU.

§290.119. Monitoring Requirements Relating to Turbidity and Disinfection for Systems Using Surface Water Treatment.

A public water system that uses a surface water source or a ground water source under the influence of surface water must monitor in accordance with this section beginning July 1, 1993.

(1) Turbidity measurements as required by §290.118 of this title (relating to Filtration) must be performed on representative samples of the system's filtered water every four hours (or more frequently) that the system serves water to the public. A public water system may substitute continuous turbidity monitoring for grab sample monitoring if it validates the continuous measurement for accuracy by calibrating on a weekly basis as a minimum frequency. Continuous monitoring results must be reported at equal intervals of four hours or less. For systems serving 500 or fewer persons, the system may reduce the turbidity sampling frequency to once per day.

(2) The residual disinfectant concentration of the water entering the distribution system must be monitored continuously, and the lowest value must be recorded each day. The system must also record the duration of the longest event when the residual leaving the plant fell below 0.2 mg/l free chlorine or 0.5 mg/l chloramine. Continuous disinfectant monitoring equipment must be calibrated at minimum frequency of monthly. If there is a failure in the continuous monitoring equipment, grab sampling every four hours may be conducted in lieu of continuous monitoring, but for no more than five working days following the failure of the equipment. Systems serving 3,300 or fewer persons may take grab samples in lieu of providing continuous monitoring on an ongoing basis at the frequencies each day as prescribed in the following chart. Systems which sell water on a wholesale basis shall monitor the disinfectant residual leaving the plant based on the total number of connections served by the wholesale provider and its wholesale customers. If at any time the residual disinfectant concentration falls below 0.2 mg/l free chlorine or 0.5 mg/l chloramine in a system using grab sampling in lieu of continuous monitoring, the system must take a grab sample every four hours until the residual disinfectant concentration meets the disinfectant requirement.

System Size by Population	Samples/day[1]
<500.	1
501 to 1,000	2
1,001 to 2,500	3
2,501 to 3,300	4

[1] The day's samples cannot be taken at the same time. The sampling intervals are subject to commission review and approval.

(3) The residual disinfectant concentration must be measured at least at the same points in the distribution system and at the same time as bacteriological samples are collected, as specified in §290.106 of this title (relating to Bacteriological Monitoring). The disinfectant residual in the distribution system must also be monitored in accordance with the requirements of §290.46(f)(2) of this chapter (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems). Results of these residual measurements must indicate a minimum residual of 0.5 mg/l chloramine or 0.2 mg/l free chlorine, depending on disinfectant used.

§290.120. Regulation of Lead and Copper.

(a) General Requirements

(1) Applicability - The requirements of this section apply to community and non-transient non-community water systems and shall be effective on July 1, 1991. New water systems will be required to meet the requirements of this section when notified by the commission.

(2) Compliance - The water system is not in compliance if it fails to meet any reporting, monitoring, public education, or other requirement in this section relating to the regulation of lead and/or copper.

(A) All applicable water systems shall determine compliance based on monitoring and reporting requirements for lead and copper established in this section or contained in 40 CFR §141 and §142.

(B) Failure to satisfactorily conduct or satisfactorily report any requirements of this section shall constitute a monitoring, reporting or treatment technique violation, and shall be a violation of these standards.

(3) Action levels for lead and copper are 0.015 mg/l and 1.3 mg/l respectively. The action levels are exceeded if the concentration of lead and/or copper in more than ten percent (10%) of the first draw tap water samples collected during any monitoring period is greater that 0.015 mg/l for lead or 1.3 mg/l for copper.

(b) Site Selection and Material Survey

(1) By the applicable date for commencement of tap sample monitoring, each system shall complete a materials survey of its distribution system to identify a pool of tap sampling sites that meet the requirements of this section. All first draw tap samples are to be collected from this pool of sites. Sampling sites may not include faucets that have point-of-use or point-of-entry treatment devices.

(2) Information for conducting a materials survey and selecting sampling sites are provided to each system by the commission before initial tap sampling is initiated in accordance with the time schedule shown on Table Number 2 paragraph (8) of this subsection. Procedural requirements set forth in 40 CFR §141.86 will be followed for site selection activities except that reporting of tap sampling sites to the Commission shall be conducted using the materials survey and site selection forms supplied by the Commission. Supplemental explanatory correspondence from the system will be considered as part of the materials survey document. Systems must make a good faith effort to conduct a thorough and complete materials survey and submit a valid sample site selection form before initial tap sampling may be conducted.

(c) Tap Sampling.

(1) A first draw tap sample means a one liter sample of tap water collected from a cold water, frequently used interior tap, after the water has been standing in the plumbing for at least 6 hours

and is collected without first flushing the tap. It is recommended that water not be allowed to stand in the plumbing for more than 18 hours prior to collection.

(2) Sample collection may be conducted by either water system personnel or the residents. If the resident is allowed to collect samples for lead and copper monitoring, the water system must provide written instructions for sample collection procedures and the system may not challenge, based on alleged errors in the sample collection process, the accuracy of the sampling results.

(3) A water system shall collect each tap sample from the same sampling site from which it collected a previous sample. If this is not possible, written explanation to the commission must be provided and an alternate site from the system's sampling pool must be selected which meets similar criteria and is within reasonable proximity to the original site.

(4) Monitoring approved by the commission and conducted by systems in addition to the minimum requirements of this section shall be considered by the commission in making any determination of compliance.

(5) Number of Tap Samples - Initial Monitoring - Systems shall collect at least one set of tap samples during each of two consecutive six-month monitoring periods.

(6) The minimum number of sample sites required for initial monitoring are listed in Table Number 1, as well as the number of sites required of each system conducting reduced monitoring.

Table No. 1

SYSTEM SIZE (No. of People Served)	INITIAL MONITORING SITES	REDUCED MONITORING SITES
>100,000	100	50
10,001 - 100,000	60	30
3,301 - 10,000	40	20
501 - 3,300	20	10
101 - 500	10	5
<101	5	5

(7) Initial tap sampling shall be conducted only after the Commission has determined that a system has successfully completed a materials survey and has obtained approval of its sample site selection form which is required to be submitted by subsection (b)(2) of this section.

(8) The first six-month initial monitoring period begins on the dates listed in Table Number 2.

Table No. 2

SYSTEM SIZE (No. of People Served)	FIRST SIX-MONTH MONITORING PERIODS BEGIN
>50,000	January 1, 1992
3,301 - 50,000	July 1, 1992
<3,301	July 1, 1993

(d) Computing 90th Percentile Lead and Copper Levels - Determination of 90th percentile levels shall be obtained by ranking the results of lead and copper samples collected during a monitoring period in ascending order (lowest concentration = sample #1; highest concentration = sample #10, 20, 30, 40, 50, etc), up to the total number of samples collected. The number of samples collected during the monitoring period shall be multiplied by 0.9 and the concentration of lead and copper in the numbered sample yielded by this calculation is the 90th percentile sample contaminant level. The system is in compliance with the lead and/or copper action levels if the 90th percentile sample contaminant level is equal to or less than the action levels specified in subsection (a)(2) of this section. For water systems serving fewer than 101 people, the 90th percentile level is computed by taking the average of the highest two sample results.

(e) Reduced Tap Monitoring.

(1) The commission shall notify each water system that it is eligible for reduced monitoring of first draw tap samples if it is in compliance with the 90th percentile lead and copper action levels after completion of two six-month periods of initial tap sampling.

(2) Reduced monitoring shall be conducted annually during June, July, August, or September by collecting one set of samples from the appropriate number of reduced monitoring sites, after notification.

(3) The number of reduced monitoring sites required for each system are found in Table Number 1 located in subsection (c)(6) of this section, if not otherwise specified by the commission.

(4) If the system exceeds an action level for lead or copper during any reduced monitoring period, then:

(A) it must follow public education requirements applicable to action level exceedances during initial monitoring found in subsection (g) of this section;

(B) collect the remaining number of samples as required for initial monitoring within 60 days. The results of all samples related to reduced monitoring will be used to determine action level exceedance. Should an exceedance of lead or copper action levels be verified, then procedures of this section applicable to action level exceedances during initial monitoring will be followed.

(5) If after three annual periods of reduced monitoring the system continues to be in compliance with the lead and copper action levels, then the system will be notified to conduct reduced monitoring once every three years.

(f) Monitoring Requirements for Water Quality Parameters (WQP's) and Source Water.

(1) Water Quality Parameters.

(A) All large water systems (serving populations greater than 50,000) are required to conduct WQP monitoring beginning with the initial period of first draw tap samples and continuing until corrosion control is optimized.

(B) All medium and small systems (serving populations of 3,301 to 50,000 and less than 3,301, respectively) that exceed the lead or copper action level shall conduct WQP monitoring beginning in the first calendar quarter following the end of the period in which the exceedance of the lead and/or copper action level took place and continue as long as the system exceeds the lead or copper action level.

(C) WQP monitoring shall be conducted quarterly for the following parameters: pH; alkalinity; calcium; conductivity; water temperature; orthophosphate (when an inhibitor containing a phosphate compound is used) and silica (when an inhibitor containing a silicate compound is used). Temperature and pH must be measured at the sampling site at the same time of sample collection.

(D) Large systems must conduct WQP monitoring at all entry points and at the number of distribution sites specified in Table Number 3 of this section. Small and medium systems that are required to conduct WQP monitoring must monitor at all points of entry and at the required number of distribution sites as shown in the Table Number 3.

Table No. 3

SYSTEM SIZE (# of people served)	INITIAL WQP DISTRIBUTION SITES	REDUCED WQP DISTRIBUTION SITES	NO. OF SITES FOR WQP MONITORING
> 100,000	25	10	25
10,001 - 100,000	10	7	10
3,301 - 10,000	3	3	3
501 - 3,300	2	2	2
101 - 500	1	1	1
< 101	1	1	1

(E) WQP distribution sites (exclusive of entry points) may be sites normally used for bacteriological monitoring and samples need not be collected inside the home. These sites shall be representative of water quality throughout the distribution system.

(F) After corrosion control treatment is installed, water quality parameters shall be measured at the initial number of distribution sites as indicated in Table Number 3 quarterly and also at entry points biweekly.

(G) WQP monitoring after corrosion control treatment is installed shall be conducted for the following parameters: pH, alkalinity, orthophosphate (when an inhibitor containing a phosphate compound is used), silica (when an inhibitor containing a silicate compound is used), and calcium (when calcium carbonate stabilization is used as part of the treatment). These parameters must be measured at all points of entry and initial distribution sites.

(H) Any water system that maintains the range of values for WQP's reflecting optimum corrosion control as approved by the commission for one year may collect quarterly distribution samples at the reduced number of distribution sites indicated in Table Number 3. WQP samples shall continue to be measured at points of entry on a biweekly basis and results submitted to the commission.

(I) Any water system that reflects optimal corrosion control treatment during three consecutive years may reduce the frequency at which it collects distribution samples for applicable WQP's to annually.

(J) Any water system that reflects optimal corrosion control treatment during three consecutive years of annual WQP distribution monitoring may reduce the frequency at which it collects the number of WQP distribution samples for applicable WQP's to once every three years.

(K) Water quality parameter testing must be conducted at a laboratory that uses the methods described in 40 CFR §141.89 and it is the responsibility of the water system to collect, submit and report these values. If a water system fails to meet the WQP values/ranges specified by the Commission it is out of compliance with this section. WQP values may be verified by the system in accordance with 40 CFR §141.82(g) of the federal regulations. The state requires that the values be reported, but is not responsible for supplying sample bottles and testing services to the water system.

(L) Any water system subject to the reduced monitoring frequency that fails to operate within the approved range of WQP values shall resume distribution sampling in accordance with the number and frequency requirements in subparagraph (F) of this paragraph.

(2) Entry Point Water Sampling.

(A) Entry point water sampling for lead and copper shall be conducted by systems that exceed the lead or copper action levels in order to determine the lead or copper content of source water. Entry point water samples shall be collected in accordance with the requirements of this section regarding sample location, number of samples, and collection methods as specified in §290.108 of this title (relating to Inorganic Chemical Monitoring and Analytical Requirements) except that one sample shall be collected from each entry point to the distribution system (no compositing) within six months after notification of the exceedance of the lead and/or copper action level. If acceptable entry point water data is not available for large systems, the entry point water lead level shall be considered as zero for purposes of determining whether a corrosion control study is required.

(B) The commission shall complete an evaluation of all entry point water sample results, along with the corrosion control study, to determine if source water treatment is necessary. If source water treatment is deemed necessary by the commission, the system must install it in accordance with the scheduling requirements specified in 40 CFR §141.83(a) of the federal regulations.

(C) Any system that installs entry point water treatment shall collect an additional round of source water samples as described above during two consecutive six-month periods within 36 months after source water treatment begins.

(D) The monitoring frequency for lead and copper in source water, after the commission determines that source water treatment is not required, or after the commission has specified the maximum permissible source water levels for lead and copper, shall be in accordance with inorganic chemical monitoring practices and procedures as stated in §290.108 of this title.

(E) Reduced source water monitoring procedures as specified in 40 CFR §141.88(e) for lead and copper will be followed by the commission. Source water samples will be submitted by the water system in addition to other inorganic chemical monitoring requirements of these standards.

(g) Public Education Procedures

(1) A water system that exceeds the lead action level based on first draw tap water sampling shall deliver to the public the public education materials as listed in 40 CFR §141.85(a), in accordance with the requirements stated in paragraphs (2) and (3) of this subsection.

(2) A community water system must, within 60 days of notification by the commission:

(A) Insert notices in each customer's utility bill that includes the information in 40 CFR §141.85(a) and print the following alert on the water bill itself or on a bill insert in large print: "**SOME HOMES IN THIS COMMUNITY HAVE ELEVATED LEAD LEVELS IN THEIR DRINKING WATER. LEAD CAN POSE A SIGNIFICANT RISK TO YOUR HEALTH. PLEASE READ THE ENCLOSED NOTICE FOR FURTHER INFORMATION.**"

(B) Submit the required information in 40 CFR §141.85(a) to the editorial departments of the major local daily or weekly newspaper circulated throughout the system.

(C) Deliver pamphlets and/or brochures that contain the public education materials as specified in 40 CFR §141.85(a)(2) and (4) to city or county health departments; to public schools or local school boards; Women, Infants and Children (WIC) and/or Head Start Programs when available; public and private hospitals and/or clinics; pediatricians; family planning clinics; and local welfare agencies, within their service area.

(D) Submit the public service announcement in 40 CFR §141.85(b) to at least five radio and/or television stations broadcasting to the area served by the water system.

(E) A community water system must repeat the tasks contained in subparagraphs (A), (B), and (C) of this paragraph, every 12 months and the tasks listed in subparagraph (D) paragraph, every six months for as long as the system exceeds the action level.

(F) Certain requirements of subparagraphs (C) and (D) of this paragraph may be modified by the commission if justified by local circumstances.

(3) A non-transient non-community water system must within 60 days of notification by the commission, deliver the public education materials in 40 CFR §141.85(c)(4) as follows:

(A) post informational posters on lead in drinking water in a public place or common area in each of the buildings served by the system, and

(B) distribute pamphlets and/or brochures on lead in drinking water to each person served by the water system.

(C) a non-transient non-community water system must repeat the tasks contained in (3)(A) and (B) of this paragraph at least once during each calendar year in which the system exceeds the lead action level.

(4) A water system may discontinue delivery of public education materials if the system has met the lead action level during the most recent six-month monitoring period. Such a system shall recommence public education in accordance with this section if it subsequently exceeds the lead action level during any monitoring period.

(5) A water system that fails to meet the lead action level as stated in subsection (a)(3) of this section shall make available to any customer who requests it, information as to how and where water samples may be submitted for lead and copper analysis.

(h) Corrosion Control.

(1) All applicable water systems shall install and operate optimal corrosion control treatment; which means the corrosion control treatment that minimizes lead and copper concentrations at users' taps while insuring that the treatment does not cause the system to violate any other drinking water standard.

(2) Large water systems (serving greater than 50,000 people) are required to conduct corrosion control studies unless they can demonstrate that corrosion control is already optimized to the satisfaction of the commission. If required to conduct a corrosion control study, a large system must complete it by July 1, 1994, and the commission shall designate optimal corrosion control treatment and parameters by January 1, 1995. The system shall install corrosion control treatment by January 1, 1997. Large systems that exceed lead and/or copper action levels must conduct a demonstration study as described in paragraph (4)(B) of this subsection.

(3) Small and medium water systems (serving less than 3,301 or serving between 3,301 and 50,000 people, respectively) are deemed to have optimized corrosion control if the system meets the lead and copper action levels during each of two consecutive six-month monitoring periods. These systems will be required to conduct a desk- top corrosion control study to optimize corrosion control if at anytime the 90th percentile action level for lead and/or copper is exceeded. The study must be conducted and submitted within 18 months after exceedance notification by the commission for medium sized water systems and within 24 months after exceedance notification for small water systems.

(4) Performance for Corrosion Control Studies.

(A) Any public water system performing a corrosion control study shall evaluate the effectiveness of each of the following treatments (or combinations of treatments) to identify the optimal control treatment:

(i) alkalinity and pH adjustments;

(ii) calcium hardness adjustment;

(iii) addition of phosphate or silicate corrosion inhibitor.

(B) The water system shall conduct this evaluation using either pipe rig/loop tests, metal coupon tests, partial systems tests (demonstration study), or analyses based on treatments in documented analogous systems (desk-top study). Analogous system means a system of similar size, water chemistry, and distribution system configuration.

(C) The water system shall measure the parameters listed in susbsection (f)(1)(C) of this section.

(D) On the basis of the evaluation stated in subparagraph (4)(A) and (B) of this paragraph, the water system shall recommend to the commission, in writing, the treatment option that constitutes optimum corrosion control/treatment along with sufficient documentation as required by the state to establish the validity of the evaluation procedure. Operational WQP ranges shall be proposed to the state where applicable.

(E) The commission will, within six months after submittal of the corrosion control study by the water system, review the study and designate optimal corrosion control treatment and parameters.

(F) The water system shall install optimal corrosion control treatment within 24 months after the commission designates optimal corrosion control treatment and notifies the system.

(G) Large systems that install corrosion control treatment shall conduct first-draw lead and copper tap sample monitoring as in initial monitoring during each of two consecutive six-month periods by January 1, 1998. Small and medium systems shall complete the above stated monitoring within 36 months after the commission designates optimal corrosion control treatment. Small and medium systems are deemed to have optimized corrosion control if action levels for lead and copper are not exceeded in two rounds of subsequent tap sample monitoring. Large systems are deemed to have optimized corrosion control if they have demonstrated through first-draw tap monitoring conducted after treatment installation and water quality parameter sampling conducted in compliance with standards set by the commission for optimum corrosion control that they are operating within commission-designated parameters.

(H) Any system that has installed corrosion control treatment and demonstrates optimal corrosion control and operates in compliance with the commission-designated optimal water quality parameters, may conduct reduced tap sampling as described in subsections (e)(1)-(5) of this section, when written permission is granted by the commission after the commission has evaluated all pertinent data. Systems that do not meet the action levels for lead and copper after installing corrosion control treatment must continue to operate in accordance with WQP requirements established by the commission and follow procedures specified in subsection (e)(4) of this section.

(I) The commission may modify, upon its own initiative or in response to a water system request or a request from interested parties, its designated corrosion control treatment or parameters. The request and commission response pursuant to modification shall be in writing.

(5) Optimization of Corrosion Control

(A) Any water system may be deemed by the commission to have optimized corrosion control treatment if the system demonstrates, to the satisfaction of the commission, that it has conducted activities equivalent to the corrosion control steps listed in paragraph (4) of this subsection.

(B) Any large water system is deemed to have optimized corrosion control if it submits results of lead and copper tap water monitoring and entry point water monitoring in accordance with this section which demonstrates for two consecutive six-month monitoring periods that the 90th percentile tap sample lead level is less than 0.005 mg/l.

(i) Lead Service Line Replacement

(1) Systems that fail to meet the lead action level in first-draw tap sampling after installing corrosion control and/or source water treatment (whichever occurs last) shall immediately begin to replace annually 7 percent of the lead service lines identified during its materials survey process unless otherwise instructed by the commission.

(2) If the system is in violation for failure to install source water or corrosion control treatment, the commission may require the system to commence lead service line replacement after the date by which the system was required to conduct follow-up monitoring as specified in subsection (h)(4)(G) of this section.

(3) The water system shall replace the entire service line (up to the building inlet) unless it demonstrates to the satisfaction of the commission in writing that it controls less than the entire service line. The written statement must indicate that the water system has none of the following forms of control over the service line: municipal ordinances, public service contracts or applicable legal authority, authority to set standards for construction, repair or maintenance, or ownership. In such a case, the system shall replace that portion of the lead service line that it controls and notify the owner that it will also replace the building owner's portion of the line. The system is not required to bear the cost of replacing the building owner's portion of the line.

(4) Lead service line means a service line which is made all or in part of lead and connects the water main to the building inlet including any lead pigtail, gooseneck, or other fitting which is connected to such line.

(5) The system may cease replacing lead service lines whenever subsequent 90th percentile first-draw-tap sampling in two consecutive monitoring periods is less than the lead action level. Lead service line replacement shall immediately resume if first-draw-tap samples exceed the 90th percentile lead action/level.

(j) Analytical and Sample Preservation Methods.

(1) Analysis for lead and copper shall be conducted using methods stated in 40 CFR §141.89, published in the June 7, 1991, Federal Register, in laboratories certified by the Texas Department of Health Bureau of Laboratories. Analysis for pH, conductivity, calcium, alkalinity, or

the phosphate, silica, and temperature may be conducted in any laboratory as long utilizing EPA methods prescribed in 40 CFR §141.89.

(2) The Practical Quantitation Limits (PQL) and the Method Detection Limits (MDL) shall be as stated in 40 CFR §141.89.

(3) The commission has the authority to allow the use of previously collected monitoring data if the data were collected in accordance with 40 CFR §141.89.

(4) All lead levels measured between the PQL and the MDL must be reported as measured and all lead levels measured below the MDL must be reported as zero.

(5) First-draw-tap samples must be received in the laboratory within 14 days after the collection date along with correctly completed laboratory submission forms supplied by the commission.

(6) Bottles supplied by the commission or the certified laboratory must be used for collecting the tap samples.

(k) Reporting and Recordkeeping Requirements.

(1) Reporting Requirements.

(A) Report all results of Water Quality Parameter (WQP) analyses including the location/address of each distribution system sampling point. This report must include each WQP specified in subsection (f) of this section, as well as all sample results from entry points to the distribution system.

(B) Where applicable, the first draw tap monitoring shall be reported within 10 days following the end of each monitoring period as specified by the commission. (Analysis results from the TDH laboratory are normally provided simultaneously to the water system and the commission.) The water system's report shall include an explanation as to why a sampling site was changed from the previous round of sampling, if applicable.

(C) As part of the site selection form, each water system shall justify the selection of sites other than Tier 1 sampling sites as defined on the site selection form and, if lead service lines are present, why the system was not able to locate a sufficient number to make up at least 50 percent of its required number of sampling sites, should this condition arise.

(D) Where applicable, the system must certify that source water treatment has been installed as recommended by the commission and that installation was done in accordance with the specified time requirements.

(E) Where applicable, the water system must certify that lead service lines have been replaced in accordance with directives of the commission and in accordance with time schedules specified in subsection (i) of this section.

(F) Where applicable, the water system must provide copies of public education materials and certification that distribution of said materials is being conducted in accordance with subsection (g) of this section.

(G) When required by the commission, the system must report any sampling data collected by the water system in addition to the items listed in subparagraphs (A)-(F) of this subsection.

(H) Corrosion control treatment data shall be reported as required by the commission for systems that:

(i) have demonstrated optimum corrosion control;

(ii) are required to specify optimum corrosion control treatment (as part of the corrosion control study);

(iii) install corrosion control treatment as designated by the commission, and

(iv) are required to evaluate effectiveness of corrosion control treatments.

(2) Recordkeeping Requirements - Records of all sampling site data, sample submission forms, analysis results, reports, surveys, letters, evaluations, schedules, commission recommendations, requirements or determinations, and any other information deemed appropriate by the water system shall be retained by the water system for a minimum of 12 years. These records include, but are not limited to, the following items:

(A) tap water monitoring results including the location of each site and date of collection;

(B) certification of the volume and validity of first-draw-tap sample criteria via a copy of the laboratory analysis request form;

(C) where residents collected the sample, certification that the water system informed the resident of proper sampling procedures;

(D) the analytical results for lead and copper concentrations (provided to each system by the commission) at each tap sample site;

(E) designation of any substitute site not used in previous monitoring periods.

§290.121. Laboratory Analyses.

(a) All samples used to determine compliance with the rules of the commission for chemical, radiological, or bacteriological analyses must be submitted to a laboratory approved by the Texas Department of Health. Non-compliance tests, such as control tests taken to operate the system, may be run in the plant or local laboratory.

(b) Methods of analysis shall be as specified in 40 Code of Federal Regulations §141.21(f) (microbiological), §141.22(a) (turbidity), §141.23(f) (inorganics), §141.24(e) (f) and (g) (organics) and §141.25 (radionuclides) of the National Primary Drinking Water Regulations, or by any alternative analytical technique as specified by the Department and approved by the Administrator under 40 Code of Federal Regulations §141.27.

(c) The commission adopts by reference the Federal Regulations referred to in subsection (b) of this section.

Adopted 09/20/95 Effective 11/03/95

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